ABSTRACT

Outer code covered synchronous code division multiple access for cable modem (CM) channels. Outer pseudo-noise (PN) code is employed, along with orthogonal codes (OCs), to spread CM signals thereby mitigating inter-code-interference (ICI) effects caused by residual multi-path propagation within CM communication systems. The added and implemented PN sequences have relatively good autocorrelation properties (when compared to the autocorrelation properties of the OCs) that mask the possible bad autocorrelation and/or cross-correlation properties of the OCs. This outer-code covered PN coding, along with the OC coding, enables much better performance in the presence of residual multi-path. The PN code's added complexity is very minimal as the PN may use the same chip rate of the orthogonal code while providing for better performance in the presence of residual multi-path components. In doing so, a relatively higher system capacity for data throughput may be realized while providing very limited added complexity to the system.